UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/900,110	07/06/2001	John Fan	P119US1	5745

7590	12/01/2004		EXAMINER

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2634	

DATE MAILED: 12/01/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>06 July 2001</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *26-29* is/are allowed.

6)☒ Claim(s) *1-8 and 14-20* is/are rejected.

7)☒ Claim(s) *9-13 and 21-25* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *07/06/2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date *7/6/01*.

4)☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____ .

DETAILED ACTION

Claim Objections

1.   Claim 25 is objected to because of the following informalities: it appears that "of" in the

phrase "decoding of second common bit groupings" on line 7 should be deleted for the sake of

consistency with respect to language used to define "subtracting" and "combining." Appropriate

correction is required.

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

3.   Claims 1-8 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Cansever et al. (US 6,807,648) in view of Wallace et al (US 6,473,467).

Consider claim 1. Referring to Fig.3, Cansever et al discloses a forward error correction

method in a wireless communication system, comprising;

"receiving a plurality of data streams" (100), see col.6, lines 14-15,

"selecting at least one bit from each of the plurality of the data streams forming a first bit

grouping" in that the data separator (142) selects header bits from each packet to form a

header portion, see col.6 lines 15-16,

"selecting at least one bit from each of the plurality of the data streams forming a second

bit grouping" in that the payload bits from each packet are selected to form "a second bit

grouping," in that the data separator (142) selects payload bits from each packet to form a

payload portion, see col.6 lines 15-16,

"coding the first bit grouping," (150), see col.6, lines 19-23,

"coding the second bit grouping," (156), see col.6, lines 26-31, and

"transmitting the coded first bit grouping and the coded second bit grouping." See

Transmitter (20) in Fig.1. Cansever et al fails to teach "transmission through spatially

separate antennae" recited in claim 1 and "each data stream is transmitted from a

corresponding spatially separate antenna."

Wallace teaches a diversity transmitter using a plurality of antennas, see Fig.1A

and col.4, lines 48-49, at least for the purpose of improving performance, i.e., lowering

bit error rate. See col.3, lines 36-47, col.6, lines 39-46 and col.11, line 58 – col.12, line

4, in particular, describing transmission of data through a corresponding one of a plurality

of antennas. Thus, it would have been obvious to one skilled in the art at the time the

invention was made to transmit the encoded data packets of Cansever et al through a

plurality of antennas for the purpose of lowering error rate as taught by Wallace et al.

Regarding claim 2 calling for "selecting a plurality of bits from each data stream" for

"forming a first bit grouping," since the header consists of a plurality of bits, see Fig.2, Cansever

et al discloses selecting a plurality of bits from each data packet to form a first bit grouping,

which is a header portion.

Regarding claim 3 calling for "selecting a plurality of other bits from each data stream"

for "forming a second bit grouping," since the payload consists of a plurality of bits, see Fig.2,

Cansever et al discloses selecting a plurality of other bits from each data packet to form a second

bit grouping, which is a payload portion.

Regarding claim 4 transmitting each data stream "from a corresponding spatially separate

antenna," Wallace describes an embodiment of diversity where data streams is demultiplexed

into four data sub-streams, one data sub-stream for each transmit antenna. See col.9, lines 31-32.

Clam 5 requires that "the plurality of data streams are generated from a single primary

data stream. Cansever is silent whether the data packets (100) are generated from a singly

primary data stream. Wallace et al further teaches a combination of antenna, frequency and/or

time diversity as a way of improving performance. See col.3, lines 34-39. it is quite

established that the time diversity means repeated transmission of a same data in temporal

succession. In other words, a plurality of data streams are generated from a single primary data

streams and transmitted sequentially. Thus, it would have been obvious to one skilled in the art

at the invention was made to generate repeat a packet for a number of times to generate a

plurality of data packets in Canserver et al's transmitter as suggested by Wallace for the purpose

of further improving performance.

Regarding claims 6 and 7 calling for "Reed Solomon coding" as a coding scheme, see

Cansever et al, col. 4, lines 61-64 describing any known coding may be adapted to the

Cansever's device including Reed Solomon coding.

Regarding claim 8 calling for a limitation that "the data streams comprise N-QAM

symbols," Cansever et al teaches any type of quadrature amplitude modulation (QAM) for the

packets. See col. 4, lines 10-18. In other words, bits in the packets are mapped to one of

symbols of QAM, reading on the limitation.

Consider claim 30. Referring to Fig.3, Cansever et al discloses a forward error correction system in a wireless communication system, comprising;

"means for receiving a plurality of data streams" (140), see col.6, lines 14-15,

"means for selecting at least one bit from each of the plurality of the data streams forming a first bit grouping" in that the data separator (142) selects header bits from each packet to form a header portion, see col.6 lines 15-16,

"means for selecting at least one bit from each of the plurality of the data streams forming a second bit grouping" in that the payload bits from each packet are selected to form "a second bit grouping," in that the data separator (142) selects payload bits from each packet to form a payload portion, see col.6 lines 15-16,

"means for coding the first bit grouping," (150), see col.6, lines 19-23,

"means for coding the second bit grouping," (156), see col.6, lines 26-31, and

"means for transmitting the coded first bit grouping and the coded second bit grouping." See Transmitter (20) in Fig.1.   Cansever et al fails to teach "transmission through spatially separate antennae."

Wallace teaches a diversity transmitter using a plurality of antennas, see Fig.1A and col.4, lines 48-49, at least for the purpose of improving performance, i.e., lowering bit error rate. See col.3, lines 36-47, col.6, lines 39-46 and col.11, line 58 – col.12, line 4, in particular, describing transmission of data through a corresponding one of a plurality of antennas.   Thus, it would have been obvious to one skilled in the art at the time the invention was made to transmit the encoded data packets of Cansever et al through a plurality of antennas for the purpose of lowering error rate as taught by Wallace et al.

4.   Claims 14-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Cansever et

al. (US 6,807,648) in view of Wallace et al (US 6,473,467) and Hinedi et al (US 6,263,466).

Claim 14 defines a method of error correction decoding comprising;

"receiving a plurality of data streams received through spatially separate antennae,"

"selecting at least one bit from each of the plurality of the data streams forming a

first bit grouping,"

"selecting at least one other bit from each of the plurality of the data streams

forming a second bit grouping,"

"decoding the first bit grouping,"

"decoding the second bit grouping," and

"constructing decoded bit streams based upon the decoded first bit grouping and

the decoded second bit grouping."   The claimed invention in claim 14 is essentially

a reverse process of the invention defined in claim 1 at a receiver side.   Although Cansever et al

in combination with Wallace teach the invention of claim 1 drawn to an encoding system, the

combination fail to disclose an error correction decoding at a receiving side that would

correspond to the error correction encoding method.   However, Hinedi et al teaches a decoding

method that reverses an encoding method in a wireless communication system.   Specifically, Fig.

10 of Hinedi et al shows that each of received data streams is separated into a first grouping, i.e.,

header, and a s second grouping, i.e., payload, by a demixer (124) and each group is separately

decoded (126,133).   Thus, it would have been obvious to one skilled in the art at the time the

invention was to reverse the encoding sequence of Cansever et al at a receiver by receiving data

packets, selecting encoded header bits from each packet to form "a first grouping" and encoded

payload bits to form "a second grouping," decoding each group in accordance with their

respective error encoding method, and constructing the whole packet from the decoded header

and payload bits, as taught by Hinedi et al.

Furthermore, Wallace et al teaches a diversity receiver using a plurality of antennas to

improve reliability of the communication link. See col.5, lines 62-67. Thus, it would have

been obvious to at the time the invention was made to design the decoding method, as explained

above, to receive data stream through spatially separate antennae for the purpose of improving

reliability of the communication link, as taught by Wallace et al.

Regarding claim 15, calling for "selecting a plurality of bits from each data stream" for

"forming a first bit grouping," since the header consists of a plurality of bits, see Fig.2, Cansever

et al discloses selecting a plurality of bits from each data packet to form a first bit grouping,

which is a header portion.

Regarding claim 16 calling for "selecting a plurality of other bits from each data stream"

for "forming a second bit grouping," since the payload consists of a plurality of bits, see Fig.2,

Cansever et al discloses selecting a plurality of other bits from each data packet to form a second

bit grouping, which is a payload portion.

Regarding claim 17 calling for "a corresponding spatially separate antenna," see Fig.1

of Wallace and col. 6, lines 48-51.

Regarding claims 18 and 19 calling for "Reed Solomon coding" as a coding scheme, see

Cansever et al, col. 4, lines 61-64 describing any known coding may be adapted to the

Cansever's device including Reed Solomon coding.

Regarding claim 20 calling for a limitation that "the data streams comprise N-QAM symbols," Cansever et al teaches any type of quadrature amplitude modulation (QAM) for the packets. See col. 4, lines 10-18. In other words, bits in the packets are mapped to one of symbols of QAM, reading on the limitation.

Allowable Subject Matter

5.   Claims 9-13,21-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

6.   Claims 25-29 are allowed, subject the objection of claim 25 is resolved.

7.   The following is a statement of reasons for the indication of allowable subject matter: no prior art has been found to teach or suggest forming a first bit grouping and a second bit grouping by selecting respective one or more of bits from a data stream for separate encoding wherein selecting the first bit grouping and a second bit grouping is based on the significance of the bits within N-QAM symbols.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin Y Kim whose telephone number is 571-272-3039. The examiner can normally be reached on 8AM --5PM M-F.
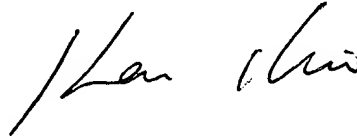
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on 571-272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent

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system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

kvk

KEVIN KIM
PATENT EXAMINER